**What is Lactoperoxidase?**

Lactoperoxidase is a natural enzyme found in the milk of most mammals, as well as other body fluids such as tears and saliva. It acts as a catalyst, oxidizing thiocyanate ions in the presence of hydrogen peroxide into hypothiocyanous acid. The acid dissociates in milk and the hypothiocyanate ions react with sulfhydryl groups to inactivate the metabolic enzymes of bacteria. This prevents bacteria from multiplying and potentially extends the acceptable quality of the raw milk. The natural lactoperoxidase system in raw milk is effective for about two hours.

**Why should it be used?**

Adding a pre-packaged activator containing thiocyanate and a source of hydrogen peroxide such as sodium percarbonate, activates and extends the effects of the natural lactoperoxidase system in raw milk. Where refrigeration is not possible, this addition increases the acceptable quality of raw milk for about 24 hours at 15°C or between 6 and 8 hours at 30°C, allowing smallholders sufficient time to store and/or transport it to a central depot for processing.

**What are the issues?**

Although refrigeration or heat treatment is the preferred method for preventing deterioration of raw milk until it can be processed or consumed, this may not be available to all small dairy producers in rural areas in developing countries. In 1991 the Codex Alimentarius Commission recognized the use of the peroxidase system in countries where technical, economic or practical situations did not allow for the cooling of raw milk. Codex recommends that any trade in milk treated by the lactoperoxidase system should only be on the basis of mutual agreement between the countries concerned, and without prejudice to trade with other countries.
Why is this important?

Consumers view dairy products as “natural”, with raw milk being exposed to few, if any, contaminants or added chemicals. Preserving raw milk through the use of refrigeration or heating meets this consumer expectation, while the addition of chemicals to activate the lactoperoxidase system in raw milk may compromise this expectation. Both heating and cooling of raw milk have the ability to delay the growth of both spoilage and pathogenic organisms. While the addition of a chemical activator to raw milk may be the only choice for some small dairy producers located in rural areas, these chemicals must be used correctly. They should not be used to disguise poor quality milk and should only be added at safe levels. There are also concerns about some chemical activator breakdown products such as cyanide, which at high levels or consumed at low levels on a continuous basis can have a negative effect on consumer health. Allowing the use of any chemical additives to preserve milk could also set a precedent, opening the door to fraud by the use of other types of chemicals in raw milk.

Conclusion

It is recognized that for small dairy producers located in rural areas in developing countries, particularly those regions with warm/hot climates without refrigeration, there may not be an option other than to use chemical activators to stimulate the effect of the lactoperoxidase system. This approach supports the generation of income and provides an inexpensive option for maintaining the quality of a nutritious food source. However, in order to maintain the good image of dairy products for consumers and to promote the consumption of dairy products in all areas of the world, this alternative should only be used when other options are not available.